IN THE CLAIMS

Please amend Claims 2-5, 7, 10, 14-17, 19, 22, 24, and 31 as indicated.

Please cancel Claims 1, 6, 12, 13, 18, and 29 as indicated, without prejudice and without disclaimer of subject matter.

1. Cancelled

2. (Currently Amended) The apparatus of claim 10 [[1]], wherein the optical communication network comprises an automatically switched optical/transport network (ASON), and wherein the UNI comprises an ASON UNI.

3. (Currently Amended) The apparatus of claim 10 [[1]], wherein the optical service logic comprises:

bandwidth monitoring logic for monitoring bandwidth utilization on a connection.

4. (Currently Amended) The apparatus of claim 10 [[1]], wherein the optical service logic comprises:

bandwidth controlling logic for controlling bandwidth utilization on a connection.

5. (Currently Amended) The apparatus of claim 10 [[1]], wherein the optical service logic comprises:

bandwidth obtaining logic for obtaining additional bandwidth for a connection.

6. Cancelled

7. (Currently Amended) The apparatus of claim 10 [[1]], wherein the optical service logic comprises:

bandwidth allocation logic for allocating bandwidth among multiple connections.

8. (Previously Presented) The apparatus of claim 4, wherein the bandwidth controlling logic prevents bandwidth utilization on the connection from exceeding a predetermined maximum bandwidth utilization.

9. (Previously Presented) The apparatus of claim 5, wherein the bandwidth obtaining logic obtains the additional bandwidth for the connection upon determining that bandwidth utilization on the connection exceeds a predetermined level.

10. (Currently Amended) ~~The~~ An apparatus ~~of claim 6,~~ to provide bandwidth management services to a user in an optical communication system, the apparatus comprising:

a network device with an optical service agent including:

an application programming interface stored on a non-transitory computer readable storage medium and executed to perform steps including receiving input from a user application indicative of application-specific bandwidth management service requirements;

a user-to-network interface (UNI) stored on non-transitory computer readable storage medium and executed to perform steps including interfacing with an optical communication network in which data is processed and transported only in optical form;

a peer-to-peer interface stored on a non-transitory computer readable storage medium and executed to perform steps including interfacing with peer users; and

optical service logic stored on a non-transitory computer readable storage medium and executed to perform steps including interacting with the application programming interface and the optical communication network via the UNI and with the peer users via the peer-to-peer interface for providing said application-specific bandwidth management services for the user, including provision of a new optical communication path between specified nodes in the optical communication network, the optical service logic comprising bandwidth relinquishing logic for relinquishing excess bandwidth for a connection, ~~wherein~~ the bandwidth relinquishing logic ~~relinquishes~~ relinquishing excess bandwidth for the connection upon determining that bandwidth utilization on the connection is below a predetermined level; and

an optical service server which authenticates the user, obtains network topological information, and employs the network topological information on behalf of the optical service

agent for providing bandwidth management services such that the network topological information is not exposed to the user.

11. (Previously Presented) The apparatus of claim 7, wherein the bandwidth allocation logic identifies an over-utilized connection and an under-utilized connection and transfers traffic from the over-utilized connection to the under-utilized connection.

12. (Cancelled).

13. (Cancelled)

14. (Currently Amended) The apparatus of claim 22 [[13]], wherein the optical communication network comprises an automatically switched optical/transport network (ASON), and wherein the UNI comprises an ASON UNI.

15. (Currently Amended) The apparatus of claim 22 [[13]], wherein the optical service logic comprises:

bandwidth monitoring logic for monitoring bandwidth utilization on a connection.

16. (Currently Amended) The apparatus of claim 22 [[13]], wherein the optical service logic comprises:

bandwidth controlling logic for controlling bandwidth utilization on a connection.

17. (Currently Amended) The apparatus of claim 22 [[13]], wherein the optical service logic comprises:

bandwidth obtaining logic for obtaining additional bandwidth for a connection.

18. (Cancelled).

19. (Currently Amended) The apparatus of claim 22 [[13]], wherein the optical service logic comprises:

bandwidth allocation logic for allocating bandwidth among multiple connections.

20. (Previously Presented) The apparatus of claim 16, wherein the bandwidth controlling logic prevents bandwidth utilization on the connection from exceeding a predetermined maximum bandwidth utilization.

21. (Previously Presented) The apparatus of claim 17, wherein the bandwidth obtaining logic obtains the additional bandwidth for the connection upon determining that bandwidth utilization on the connection exceeds a predetermined level.

22. (Currently Amended) ~~The~~ An apparatus ~~of claim 18~~ comprising,

a network device including:

a user application requiring communication services from an optical communication network in which data is processed and transported only in optical form; and

an optical service agent stored on a non-transitory computer readable storage medium and executed to perform steps including, responsive to signaling from the user application, communicating with the optical communication network and providing application-specific optical communication network bandwidth management services for the user application, including provision of a new optical communication path between specified nodes in the optical communication network, the optical service agent having:

a user-to-network interface (UNI) for interfacing with the optical communication network and a peer-to-peer interface for interfacing with peer users; and

optical service logic for interacting with the optical communication network via the UNI and with the peer users via the peer-to-peer interface for providing said bandwidth management services for the user application, the optical service logic comprising:

bandwidth relinquishing logic for relinquishing excess bandwidth for a connection, ~~wherein~~ the bandwidth relinquishing logic ~~relinquishes~~ relinquishing excess

bandwidth for the connection upon determining that bandwidth utilization on the connection is below a predetermined level; and

an optical service server which authenticates the user application and obtains network topological information which is employed on behalf of the optical service agent for providing bandwidth management services such that the network topological information is not exposed to the user application.

23. (Previously Presented) The apparatus of claim 19, wherein the bandwidth allocation logic identifies an over-utilized connection and an underutilized connection and transfers traffic from the over-utilized connection to the under-utilized connection.

24. (Previously Presented) A system comprising:

an optical communication network in which data is processed and transported only in optical form;

a first network user coupled to the optical communication network, ~~wherein~~ the first network user ~~comprises~~ comprising:

an optical service agent stored on a non-transitory computer readable storage medium and executed to perform steps including:

responsive to signaling from a user application, ~~to obtain~~ obtaining application-specific optical communication services from the optical communication network via a user-to-network interface (UNI) communicating with the optical communication network and for providing application-specific bandwidth management services for the first network user, including provision of a new optical communication path between specified nodes in the optical communication network,

the optical service agent having optical service logic for interacting with the optical communication network via the UNI for providing said bandwidth management services for the user application, the optical service logic comprising bandwidth relinquishing logic for relinquishing excess bandwidth for a connection; the bandwidth relinquishing logic relinquishing excess bandwidth for the connection upon determining that bandwidth utilization on the connection is below a predetermined level; and

an optical service server which authenticates the first network user and network topological information which is employed on behalf of the optical service agent for providing bandwidth management services such that the network topological information is not exposed to the first network user.

25. (Original) The system of claim 24, wherein the optical communication network comprises an automatically switched optical/transport network (ASON), and wherein the UNI comprises an ASON UNI.

26. (Previously Presented) The system of claim 24, wherein the optical service agent monitors bandwidth utilization on a connection.

27. (Previously Presented) The system of claim 24, wherein the optical service agent controls bandwidth utilization on a connection.

28. (Previously Presented) The system of claim 24, wherein the optical service agent obtains additional bandwidth for a connection.

29. (Cancelled)

30. (Previously Presented) The system of claim 24, wherein the optical service agent allocates bandwidth among multiple connections.

31. (Currently Amended) A computer program product, comprising a non-transitory computer usable medium having a computer readable program code embodied therein, said computer readable program code adapted to be executed to implement a method for managing bandwidth for a user application in an optical communication system in which data is processed and transported only in optical form, the-method comprising:

monitoring bandwidth utilization, using an optical service agent associated with the user application, on a connection in the optical communication system;

controlling bandwidth utilization, using the optical service agent associated with the user application, on the connection in the optical communication system in response to signaling from the user application to provide application-specific bandwidth utilization control;

obtaining additional bandwidth , using the optical service agent associated with the user application, for the connection in the optical communication system in response to signaling from the user application to provide application-specific additional bandwidth, including provision of a new optical communication path between specified nodes in the optical communication system;

relinquishing unused bandwidth, using the optical service agent in the user application, for the connection in the optical communication system in response to signaling from the user application to provide application-specific relinquishing of bandwidth; and

allocating bandwidth, using the optical service agent, among multiple connections in the optical communication system,

prior to which an optical service server executes the following steps:

authenticating the user application;

obtaining network topological information; and

employing the network topological information on behalf of the optical service agent to provide bandwidth management services such that the network topological information is not exposed to a first network user.

32. (Previously Presented) The computer program product of claim 31, wherein the method further comprises controlling bandwidth utilization on a connection comprises:

monitoring bandwidth utilization on the connection;

determining that the bandwidth utilization has exceeded a predetermined level; and

taking an action to prevent the bandwidth utilization from exceeding predetermined maximum bandwidth utilization.

33. (Previously Presented) The computer program product of claim 32, wherein the method further comprises taking an action to prevent the bandwidth utilization from exceeding a predetermined maximum bandwidth utilization comprises dropping packets.

34. (Previously Presented) The computer program product of claim 31, wherein the method further comprises obtaining additional bandwidth for a

connection comprises:

monitoring bandwidth utilization on the connection;

determining that the bandwidth utilization has exceeded a predetermined level; and obtaining additional bandwidth for the connection.

35. (Previously Presented) The computer program product of claim 31, wherein the method further comprises relinquishing unused bandwidth for

a connection comprises:

monitoring bandwidth utilization on the connection;

determining that the bandwidth utilization is below a predetermined level; and

relinquishing excess bandwidth for the connection.

36. (Previously Presented) The computer program product of claim 31, wherein the method further comprises allocating bandwidth among multiple connections comprises:

monitoring bandwidth utilization on a number of connections;

identifying an over-utilized connection and an under-utilized connection; and

transferring traffic from the over-utilized connection to the underutilized connection.